Targeting Change for Active Travel

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Abstract. In an attempt to address the climate crisis and to deliver more resilient transport systems, it is important to use all transport options. Active Travel has come to the fore once again, while governments are trying to meet the United Nations Sustainable Development Goals. In the UK for example, it has become a statutory requirement for Active Travel England to be consulted about any new walking, wheeling or cycling infrastructure project. However, evidence suggests that the uptake of Active Travel initiatives remains low. An important component of Active Travel planning are local users, since they are the ones who will have to use any new infrastructure in the long-term.

Building on past research, this study is based on a cross-sectional survey about walking and cycling distributed in the UK. 474 responses were received and 252 valid responses were used in the ANOVA analysis. Active Travel barriers reported include for example lack of dedicated cycle lanes, inadequate lighting and insufficient pedestrian crossings, all of which are commonly mentioned in the literature. The innovation of this study is that it included the Stages of Change in a single survey, offering a holistic approach to support resilient infrastructure planning. Survey results facilitate the prioritisation of Active Travel projects based on travel activity and socio-economic group. Such a behavioural change approach allows local authorities to develop targeted Active Travel schemes and policies to support infrastructure development, while justifying the funds invested. Overall, findings can support local and regional authorities worldwide to improve Active Travel uptake.

Keywords: Active Travel · Change · Cycling · Local Authorities · Walking

1 Introduction

Transport is one of the key components of the Sustainable Development Goals (SDGs) since it can support social inclusion and economic development, but at the same time it is among the highest contributing greenhouse gas sectors (EC, 2024a). It has been consistently found to emit around 23% of the energy related CO_2 contributing to global warming (ITF, 2021). Active travel has been identified as one of the main tools, which can aid in meeting climate targets due to the low or total lack of emissions while travelling.

Walking and cycling are the core elements of active travel, which has seen a growing interest during the past decade. This interest has been expressed by local and national authorities, businesses and the private sector. Consequently, it is no surprise that it is currently high in the agenda of policy makers.

For example, the European Union has endorsed cycling as a key milestone through the European Declaration on Cycling (EC, 2024a). Its potential towards meeting 2030 and 2050 climate targets is undeniable. Equally, walking has been found to attract double the number of visits to local town centres compared to car driving, which in turn increases high-street spending. It has been estimated that active travel can increase retail spending by up to 30% (TfL, 2018). Acknowledging this potential, the EU Road Safety Policy Framework has increased the priority of road safety and accessibility for pedestrians, cyclists and electric vehicle users throughout the TEN-T (Trans-European Transport Network) infrastructure in Europe (EC, 2024b).

The increased importance of active travel has been evident across Europe during the past decade, which was further exacerbated during the COVID-19 pandemic (Buehler and Pucher, 2024; McElroy et al., 2022). Through the constant updates of Sustainable Urban Mobility Plans (SUMP), active travel has been gaining ground in contributing towards meeting local, national and international climate targets using diverse paradigms (EC, 2024c), such as the Avoid – Shift – Improve (ASI). Monza in Italy, for example, published its first SUMP in 2024, which outlines plans to address a modal shift with 50% less car trips and 20% more active travel trips (Do, 2024). On the other hand, Flanders has been at the forefront of promoting e.g. cycling in Europe for a decade, so offers 2,800 km of 130 cycle highways. This has resulted in a 54% increase in the number of cyclists in 2024 compared to 2019 (Arnoudt, 2024). Many more cities across Europe are introducing initiatives to support active travel, ranging from a new 1.2km cycling and pedestrian path in Cēsis (LSM, 2024) to 200 shared bicycles in Tallinn (SmartCitiesWorld, 2024) and a new strategic partnership to enhance active mobility in Malta (Independent, 2024). In the UK, Active Travel England has been established and is a requirement to be consulted about any new walking, wheeling or cycling infrastructure project, whereas local authorities have set their own policies. In Surrey for example, Local Transport Plan (LTP4) was launched in late 2022 and active travel has a core role to meet wider targets (SCC, 2022).

However, evidence suggests that the uptake of active travel initiatives remains low. A 2024 survey of 3,183 households in Surrey revealed that 45% of journeys were made by car, 22% on foot and only 2% by bicycle (AECOM, 2024). This proves that Surrey has a high rate of drivers, which is linked with high car ownership levels, but also that any COVID-19 impact was temporary and that both active travel and public transport levels have not increased significantly since. Furthermore, this evidence demonstrates that an important component of behavioural change and active travel planning, namely users, needs to become a more integral component. Users of road infrastructure have to be invited to offer their input more systematically, since they are the ones who will have to use any new infrastructure in the long-term. This justifies the suggestions of the European Declaration on Cycling, which stressed the role of infrastructure provision, data collection and inclusivity considerations (EC, 2024a). In brief, it called for a better

co-ordinated stakeholder collaboration to ensure that *"nobody is left behind"*. Yet, it is unclear how to achieve this in practice.

Therefore, this chapter aims to contribute in meeting this objective by focusing on user needs to increase the uptake of active travel. Based on a survey distributed in the UK, it highlights key barriers and focus areas to aid in improving the planning and usage of active travel infrastructure. This is accomplished by using the transtheoretical mode and its stages of change in a single survey. Findings can support local and regional authorities worldwide to enhance active travel uptake. The rest of this chapter includes the overview of the research method in Sect. 2. The presentation of the findings in Sect. 3. The discussion and conclusions in Sect. 4.

2 Method

2.1 Theoretical Background

The transtheoretical model was used by Prochaska et al. (1994) to focus on health behaviour change through a set of 12 behaviours, including exercise. This model was introduced as an integrative and comprehensive model of behaviour change. Their context was different since smoking cessation and other problematic behaviours were among their focus, but their paradigm is applicable to active travel given the similar challenges faced. Active travel users go through very similar stages of change during their decision making process when reviewing and deciding about modal shift. In brief, four major types of consequences were summarized in Prochaska et al. (1994):

i) utilitarian gains or losses for the individual

ii) utilitarian gains or losses for significant others

iii) approval or disapproval from significant others

iv) self-approval or self-disapproval.

Gatersleben and Appleton (2007) applied the transtheoretical model focusing on cycling. A fundamental assumption is that this model *"views behavioural change as a process rather than as an event"* (Gatersleben and Appleton, 2007). This chapter builds on their approach and takes it further by expanding their focus. Instead of only focusing on cycling, this chapter focuses on active travel and instead of just University staff or students, this chapter focuses on residents across Surrey in the UK. The rationale is that different strategies are required to support transport users who are in different stages of change into the Action and Maintenance stages within the active travel context.

2.2 Survey Design

A cross-sectional online survey was designed with two parts. One focusing on walking and one focusing on cycling preferences of current residents in the selected UK area. It was distributed during August and September of 2021 across Surrey, UK through local authorities, the Federation of Small Businesses and community groups. Standard socio-demographic data were also collected through this survey, which evaluated preferences

according to the Prochaska et al. (1994) and Gatersleben and Appleton (2007) Stages of Change model using a 6-point Likert scale. A condensed number of stages was formulated to operationalise the Stages of Change model during the survey design and analysis stages. The stages of change were grouped into four stages for the analysis presented in this chapter:

- *Not feasible*
- *Pre-contemplation*
- *Contemplation / Decision / Action*
- *Maintenance.*

with the Contemplation / Decision / Action stage constituting the main target for behavioural change. Essentially, this analysis allows to distinguish between those who consider taking up active travel as:

- *not feasible, so are out of the scope for such schemes*
- *something that only have thought about it*
- *something that they have already discussed or decided or even acted about it*
- *something that they are well aware of and plan on continuing it.*

The interventions suggested through the 2021 Active Travel survey (Gatersleben et al., 2021) are listed in Table 1. This chapter focuses more on the Table 1 suggestions in bold, mainly due to their feasibility to implement in a short-term timeframe within existing resource restrictions, while covering both walking (Wider footpaths, CCTV) and cycling (Better marking and signage, More cycle parking areas) interventions.

Table 1. Suggested interventions based on the Surrey Active Travel Survey 2021.

Walking Interventions	Cycling Interventions
Wider footpaths	Bicycle lanes
Better lighting	Better marking and signage
Closed Circuit TeleVision (CCTV)	More bicycle parking areas
More pedestrian crossings	

2.3 Sample and Analysis

A 6-point Likert scale was used in the survey and 474 responses were initially received, while 252 responses were used as the final sample for data analyses in this chapter after data cleaning to remove the responses with substantial missing values. The survey complied with the University of Surrey Research Ethics Committee requirements, so no survey questions were compulsory. Since not all respondents answered all survey questions, they were included or excluded from this analysis accordingly.

Suggestions deriving from the Active Travel Survey 2021 (Gatersleben et al., 2021) have been adapted to focus on five journey purpose categories, which are of high interest to local and regional authorities due to ongoing plans and activities, namely travelling:

- *To school with children*
- *To work*
- *To grocery stores or for household shopping*
- *To leisure places*
- *For pleasure*

The analysis focused independently on each of these journey purposes for walking and cycling, while aiming to answer five interrelated questions:

- *Survey respondents' socio-demographic profile within each Stage of Change?*
- *What would support drivers to walk or cycle more?*
- *Which is the most effective intervention?*
- *Does the effectiveness of intervention vary among journey purposes?*
- *Does the effectiveness of intervention vary among Stages of Change?*

Crosstabulations were conducted to do the profiling in terms of respondent demographics and travel characteristics as per Question 1. ANOVA tests were applied to answer Question 2 to 4 by comparing the group means of the likelihood of walking or cycling more. Open ended question responses were analysed with qualitative research software and word clouds were used to present selected findings.

3 Findings

3.1 Which Respondents Are in Which Stage of Change?

This section presents first presents findings about walking and then about cycling. Detailed survey results are available in the Appendix.

Walking

Walking: To school with children

Parents with a different number of children in their care, status-quo transport, and distance to school tend to have different acceptance levels of walking to school with children. Respondents prefer walking to school if their kids are younger, while parents who have older children (i.e. aged 11–18) replied that walking to school is not feasible for them. When looking at the respondents' currently used transport mode, car drivers have the least motivation and correspond to 90% of respondents in the Not feasible stage. Those who selected cycling as their current transport mode are more open in trying to walk to school. At the same time, 50% of those currently cycling to school are at the Pre-contemplation stage, which is significantly higher than other stages. The other major factor affecting the attitudes of respondents towards walking their children to school is the distance to school. According to the information in Fig. 1, the closer a respondent lives to the school of their children, the higher their preference to try walking to school. For most respondents in the Maintenance stage already, the distance between their home and the school of their children is less than 5 miles. Interestingly, parents of children at schooling age who live within 1 and 5 miles away from the school of their children have the highest propensity for behaviour change, since they have the highest representation in the Pre-contemplation and Contemplation/Decision/Action stages.

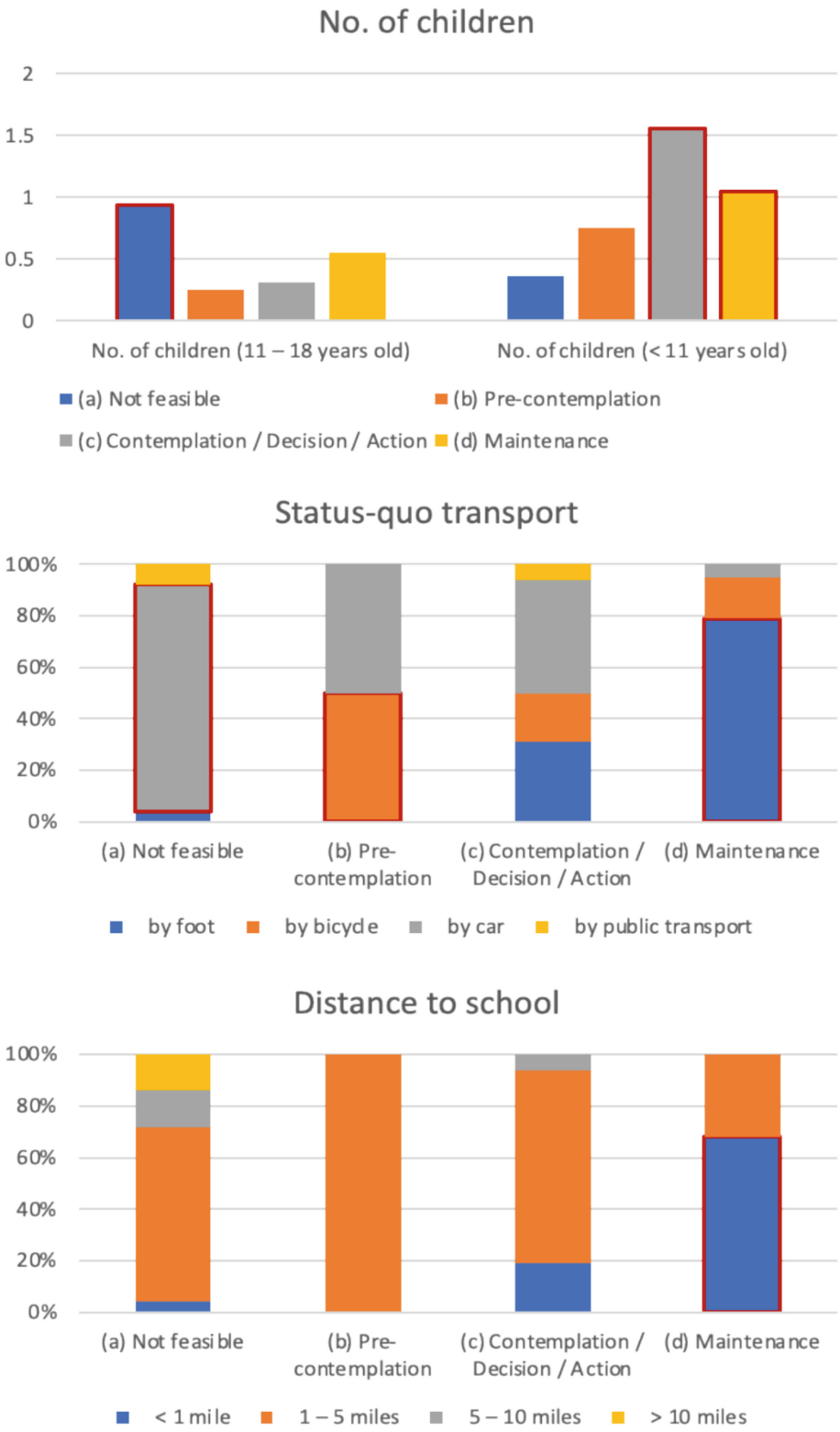

Fig. 1. Walking to school with children and Stage of Change analysis.

Walking: To work

Regarding walking to work, status-quo transport and distance from the workplace are the most important factors affecting the Stage of Change of respondents (Fig. 2). It is

Fig. 2. Walking to work and Stage of Change analysis.

not unexpected to find out that respondents who currently walk to work dominate (94%) the Maintenance Stage of Change. Out of those in the Contemplation/Decision/Action Stage of Change, respondents who currently cycle are more willing to shift to walking to work. Respondents with the car as their status-quo transport mode account for 59%, 87%, and 34% respectively for the first three Stages of Change. This indicates that 87% of those could be willing to walk to work, but have not tried it to put into practice yet. Interestingly, those who use public transport replied that it is not possible to walk to work, which demonstrates practical, infrastructure and potential personal situation (e.g. disability) restrictions. As expected, respondents are more willing to walk to work if the distance is manageable. Based on Figs. 2b and 5 miles could be the maximum distance which respondents would consider manageable to walk to work. This is supported by the finding that most respondents in the Maintenance Stage of Change live less than 5 miles away from their workplace. On the contrary, 49% of respondents who stated that it is not feasible for them to walk to work live more than 10 miles away from their workplace.

Walking: To grocery stores or for household shopping

Weekly trip frequency, respondent age and distance travelled vary among the different Stages of Change regarding walking to the grocery store or for other household shopping. Figure 3 showcases that 37% of those aged 51–60 years old fall into the Not feasible Stage of Change. Moreover, Fig. 3 shows that there is a clear positive relationship between weekly travel frequency and preference towards walking for essential shopping. Respondents at the Maintenance stage walk for essential shopping 4.49 times per week on average, which is significantly higher than the frequency of 2.38 and 2.3 times in the Not feasible and Pre-contemplation stages correspondigly. The overall responses tend to be sensitive to the travel distance, when considering walking for essential shopping. As clearly illustrated in Fig. 3, 46% (c) and 79% (d) of the respondents live less than 1 mile away from shopping facilities, which is significantly higher than in the Not feasible or Pre-contemplation Stages of Change. However, even a slight increase in distance travelled to 5 or more miles has a significant effect on respondents, since the majority seems to belong in the first three Stages of Change in that case.

Walking: Leisure

According to Fig. 4, there seems to be a clear difference regarding walking to places for leisure. Gender distributions differ across all Stages of Change. It seems to be Not feasible to walk to leisure places for a significant number of female respondents, compared to the other Stages of Change. In contrast, male respondents seem to be more in the Pre-contemplation (78%) or the Contemplation/Decision/Action (47%) Stage of Change. Remarkably, there seems to be an almost perfect balance of respondents of both genders who are in the Maintenance Stage of Change.

Another interesting finding is that frequency of travelling to leisure places has a negative relationship with respondent preferences about walking. Respondents seem to be more keen in walking to leisure places when they travel to leisure places more frequently. Those respondents in the Not feasible Stage of Change are used to driving to leisure places. Nevertheless, they are still open in considering walking as demonstrated by the high proportions respectively for Pre-contemplation and Contemplation/Decision/Action. Not surprisingly, those who already walk to leisure places represent the highest proportion of the Maintenance Stage.

Cycling

Cycling: To school with children

People with different numbers of young children and different types of status-quo transport tend to have different preferences about cycling to school with children. Remarkably, respondents in the Contemplation/Decision/Action and in the Maintenance Stages of Change have younger children compared to respondents in the Not feasible or Pre-contemplation stages. Regarding the respondents group with the highest potential for behavioural change, those respondents who currently travel by car could be the focus, since 75% of them is in the Pre-contemplation stage. On the other hand, the Maintenance stage seems to be monopolised by respondents who have already accepted cycling as their main transport mode.

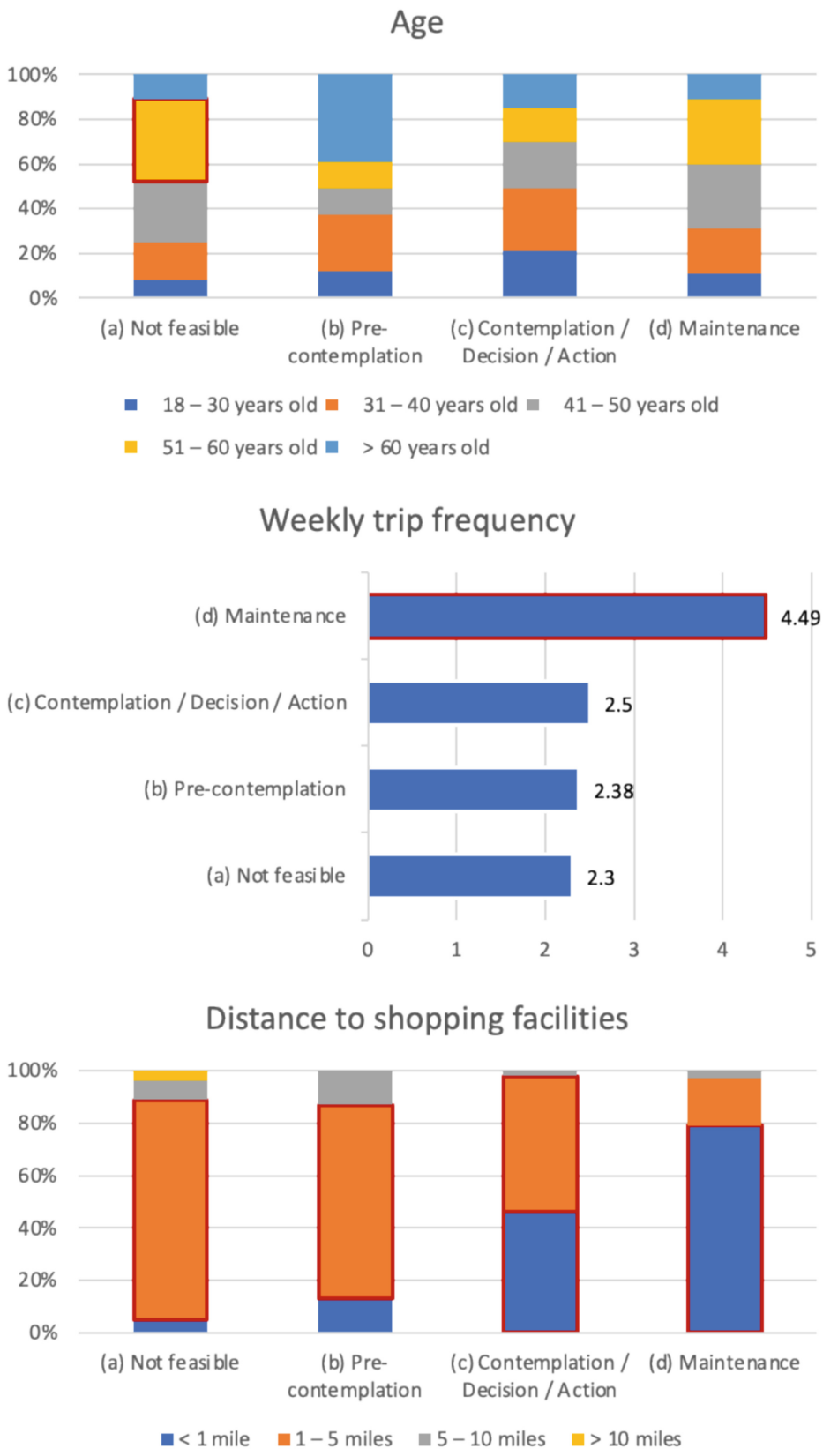

Fig. 3. Walking to grocery stores or for household shopping and Stage of Change analysis.

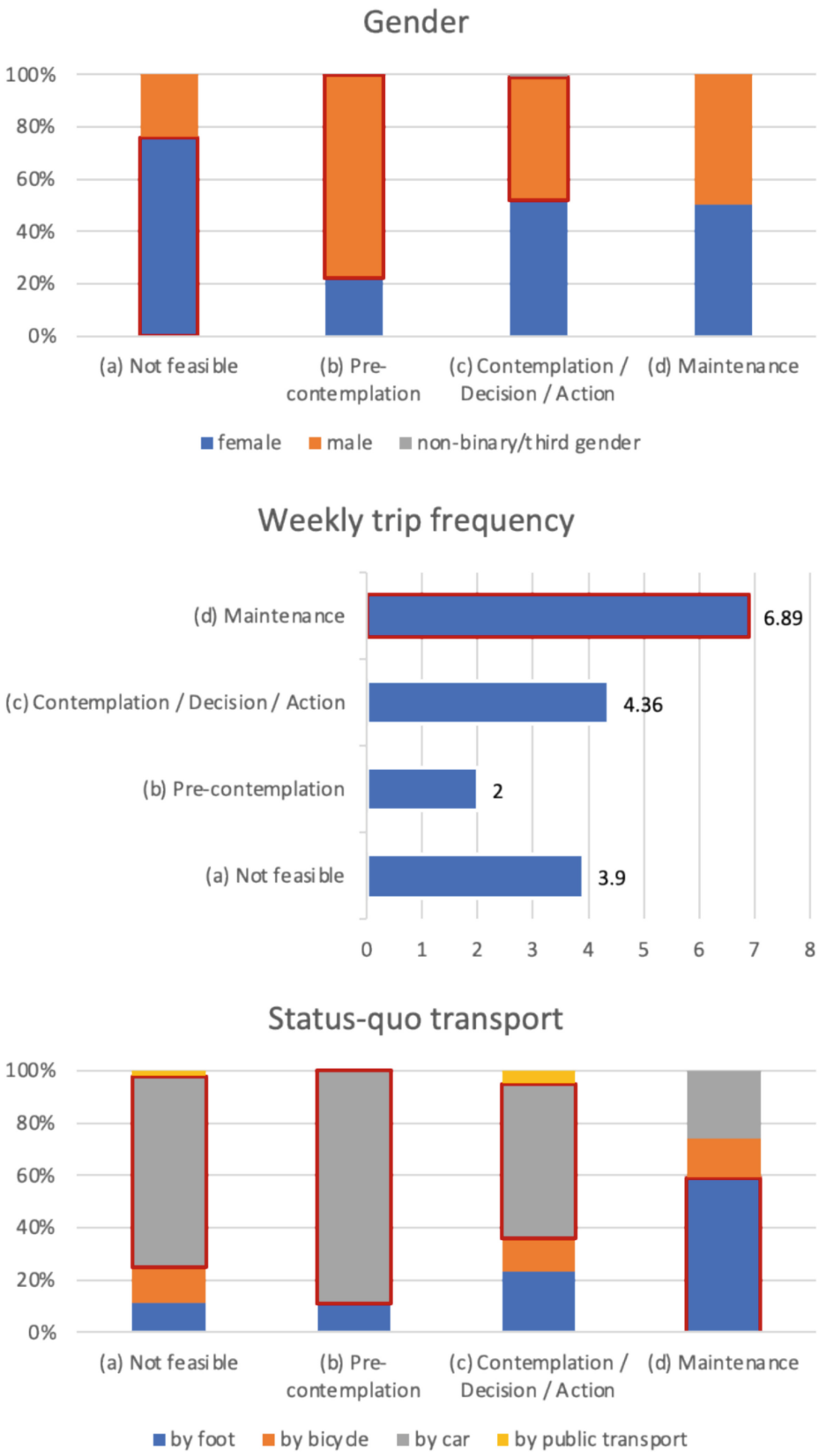

Fig. 4. Walking to leisure places and Stage of Change analysis.

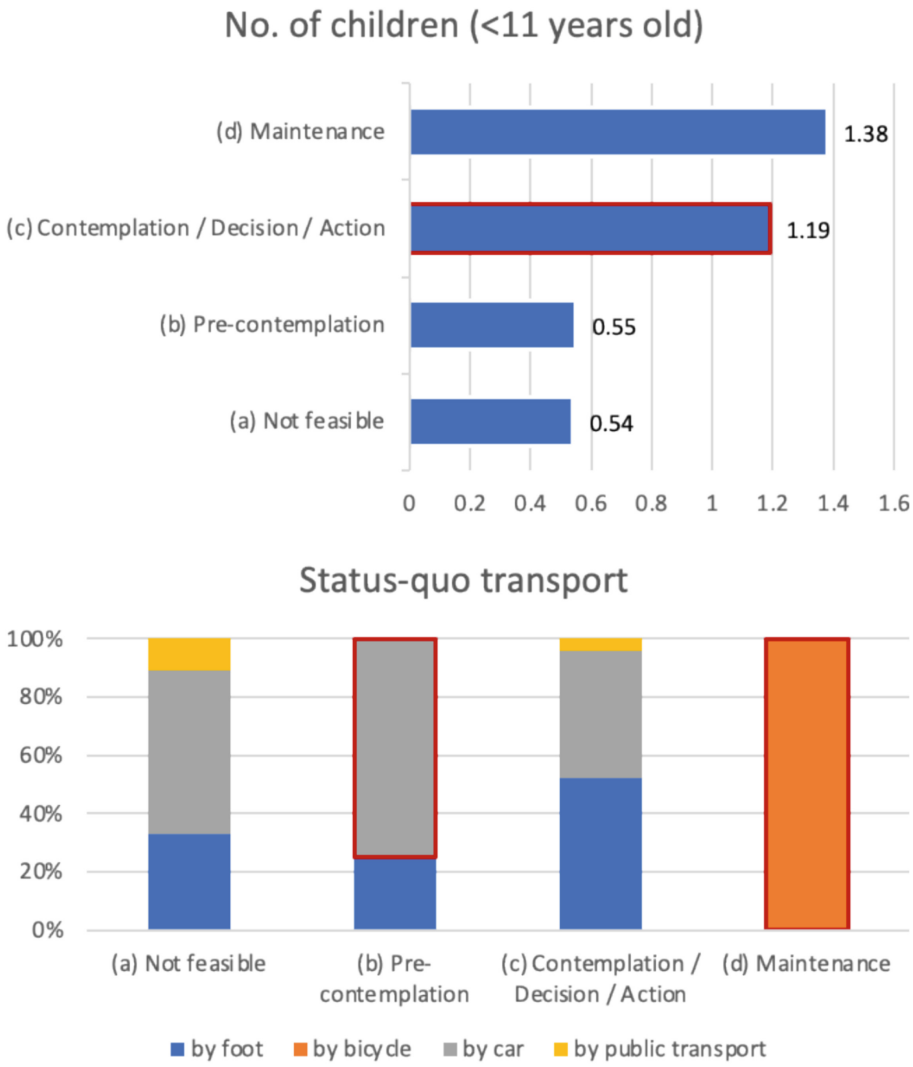

Fig. 5. Cycling to school with children and Stage of Change analysis.

Cycling: Work

The survey analysis suggests that responses have significant differences in gender, age, number of household adults, weekly trip frequency, and status-quo transport when focusing on cycling to work. It is notable from Fig. 6 that female respondents find cycling to work more difficult, since only 30% of respondents in the Maintenance stage are female. This is a stark contrast with the Contemplation/Decision/Action (c) Stage of Change where almost double (60%) are female respondents. Regarding the age of respondents, it turns out that respondents up to 40 years old represent more than 60% of respondents in the Maintenance Stage. Older respondents are concentrated (18%) in the Not feasible and Pre-contemplation Stages of Change. Respondents in households with more adults seem to be in the Pre-contemplation (2.41) or Contemplation/Decision/Action (2.46) Stage of Change. Despite being the most populous respondent groups (65% and 55%), there seems to be potential by car drivers for behavioural change and perhaps contributing towards the SDGs since they are in the Pre-contemplation or Contemplation Stages of Change.

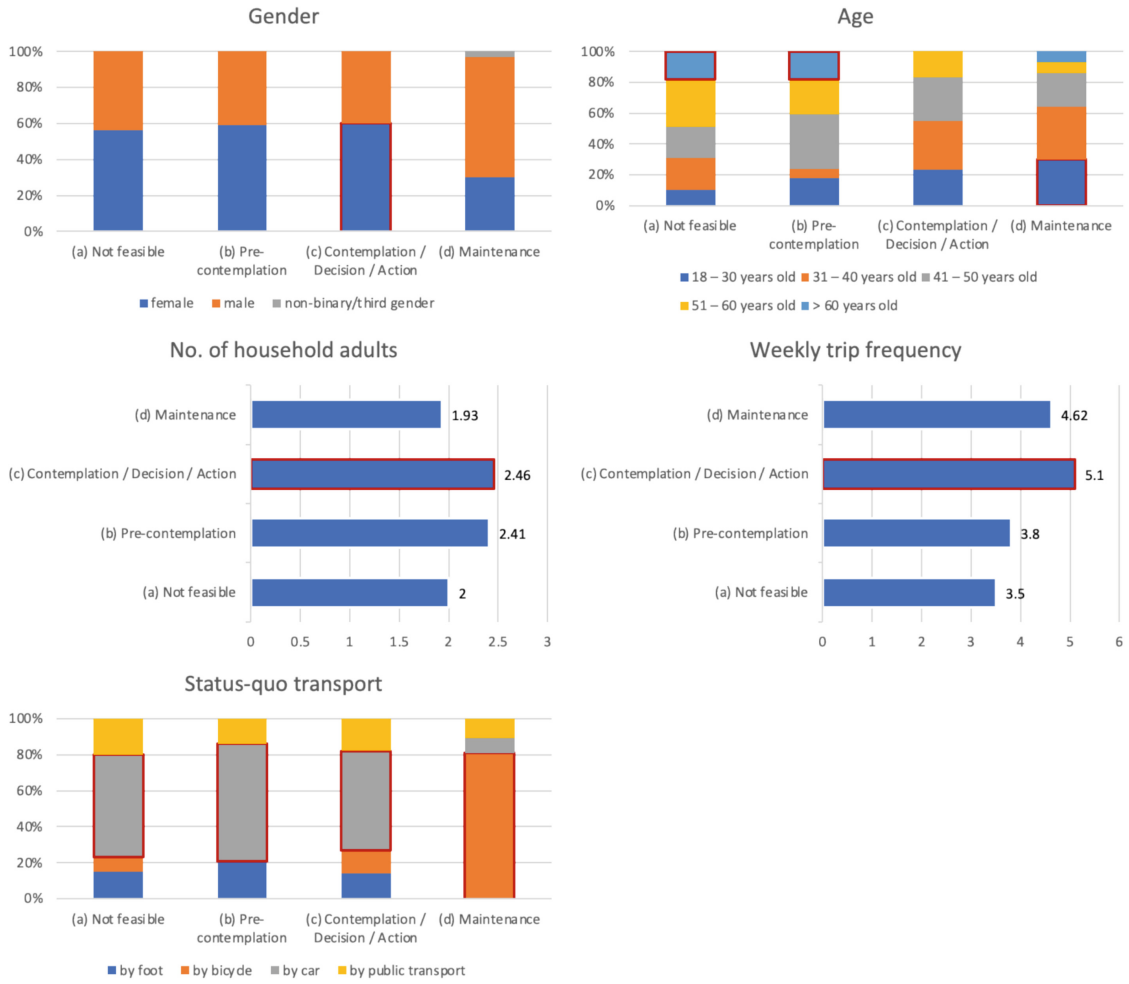

Fig. 6. Cycling to work and Stage of Change analysis.

Cycling: To grocery stores or for household shopping

The number of children aged 11 years old or less, current travel habits, and distance to shopping facilities seem to be the major factors when respondents consider cycling to the grocery or to conduct other essential shopping. The respondents in the Pre-contemplation and Contemplation/Decision/Action Stages of Change have more children aged 11 or younger on average compared to the respondents in stages (a) and (d). 83% of respondents in the Not feasible Stage of Change are driving for essential shopping, whilst at the same time more than 50% of those driving are in the Contemplation/Decision/Action Stage of Change. It is interesting to find out that around 50% of those in the Pre-contemplation, Contemplation/Decision/Action and Maintenance Stages of Change have to travel less than 1 mile to reach their grocery or other shopping destinations (Fig. 7).

Cycling: Leisure

A considerable proportion of respondents (24%) aged 51 or older stated that cycling to leisure places is not feasible for them (Fig. 8). Equally, they make up 22% of those in the Pre-contemplation stage, but only 6% of those in the Contemplation/Decision/Action Stage of Change. Respondents in the Pre-Contemplation or Contemplation/Decision/Action Stage of Change seem to have on average more adults in

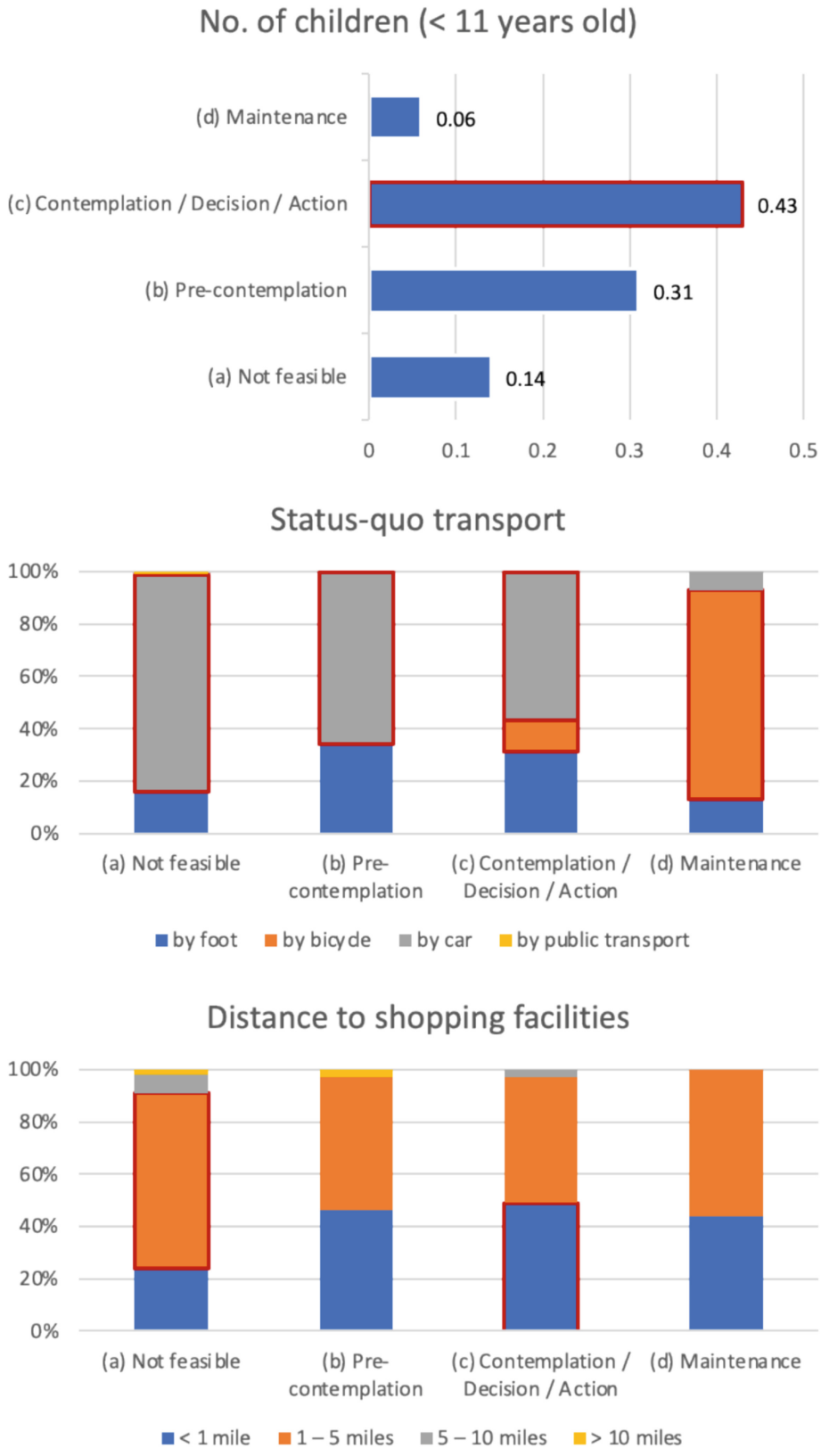

Fig. 7. Cycling to grocery stores or for household shopping and Stage of Change analysis.

their household, but only marginally. Findings are mixed regarding respondents who drive a car to leisure places. Although 66% of respondents in the Not feasible Stage of Change drive to leisure places, equally high proportions (e.g. 60%) of those in the Contemplation/Decision/Action Stages of Change are currently driving a car. This means that there are car drivers who are considering or already taking action to start cycling to leisure places.

3.2 Supporting Current Car Drivers to Walk or Cycle More

Considering that status-quo drivers are mostly in the Not-feasible Stage of Change to start walking or cycling, it is interesting to explore what could make them take up active travel.

Support Current Car Drivers to Walk More

Survey respondents who currently drive were asked under what circumstances they would consider walking more in their area. Out of the respondents, 44 drivers regularly drove their children to school, 87 drove to work, 152 drove for essential shopping and 141 drove to leisure places. Commonly mentioned changes needed to support them take up active travel were better and more accessible footpaths and pavements, shorter distances to their destination, CCTV monitoring, good level lighting to improve safety, and less traffic in footpaths and cycleways or roads in general.

Specifically, Fig. 9 shows that safer paths and areas in general, wider and better pavements, good weather, lighting and CCTV, and suitable roads such as anti-buggy would encourage people to walk their children to school more. In addition, wider pavements and improved pedestrian crossings, shorter travel distances would likely encourage drivers to walk to work.

Incentives to cycle more also features in the analysis. Carrying bags back from a shop was noted as a considerable challenge when walking. Awareness of health benefits was seen as a reason for drivers to consider walking. Nicer, wider safer routes that are maintanined well were indentified as important.

Support Current Car Drivers to Cycle More

Similarly, when asked under what circumstances drivers would cycle more to take children to school, to work, to grocery shopping, to leisure places, it was noted that better infrastructure such as dedicated cycle paths, secure and safe paths, improved signage, less cars, reduced speed, bike parking facilities were mentioned as supporting measures. Figure 10 shows commonly mentioned changes suggested.

Specifically, Fig. 10 shows that safety of children, safety from cars, better and segregated bicycle routes, and parking are important for safely cycling children to school. In addition, wider bicycle lanes with physical barriers, safe storage areas to address the fear of bicycle theft, weather conditions and facilities to change clothes were identified as important for drivers to change behaviour and cycle to work. Incentives to cycle more also feature as a suggestion in the analysis.

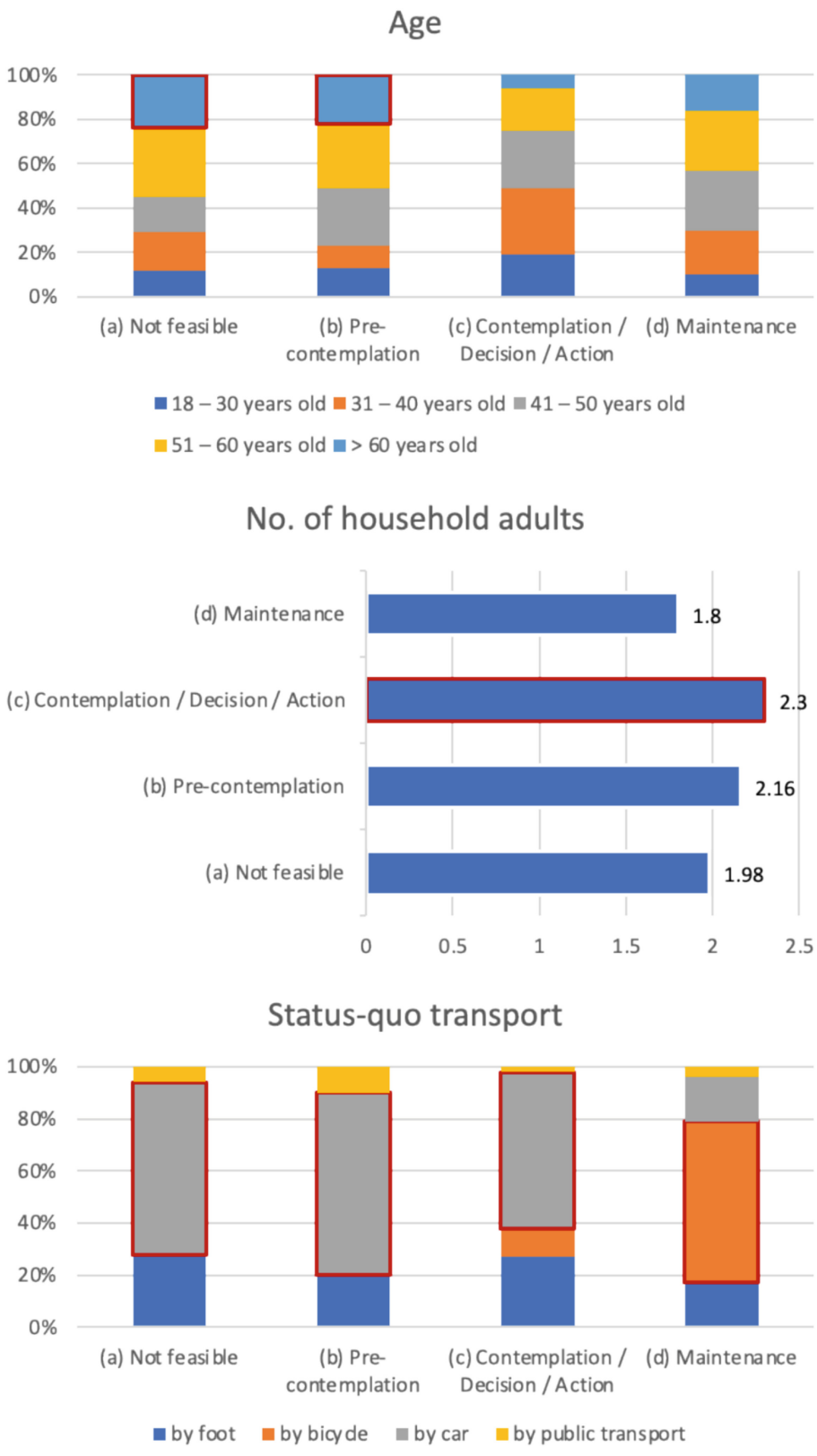

Fig. 8. Cycling to leisure places and Stage of Change analysis.

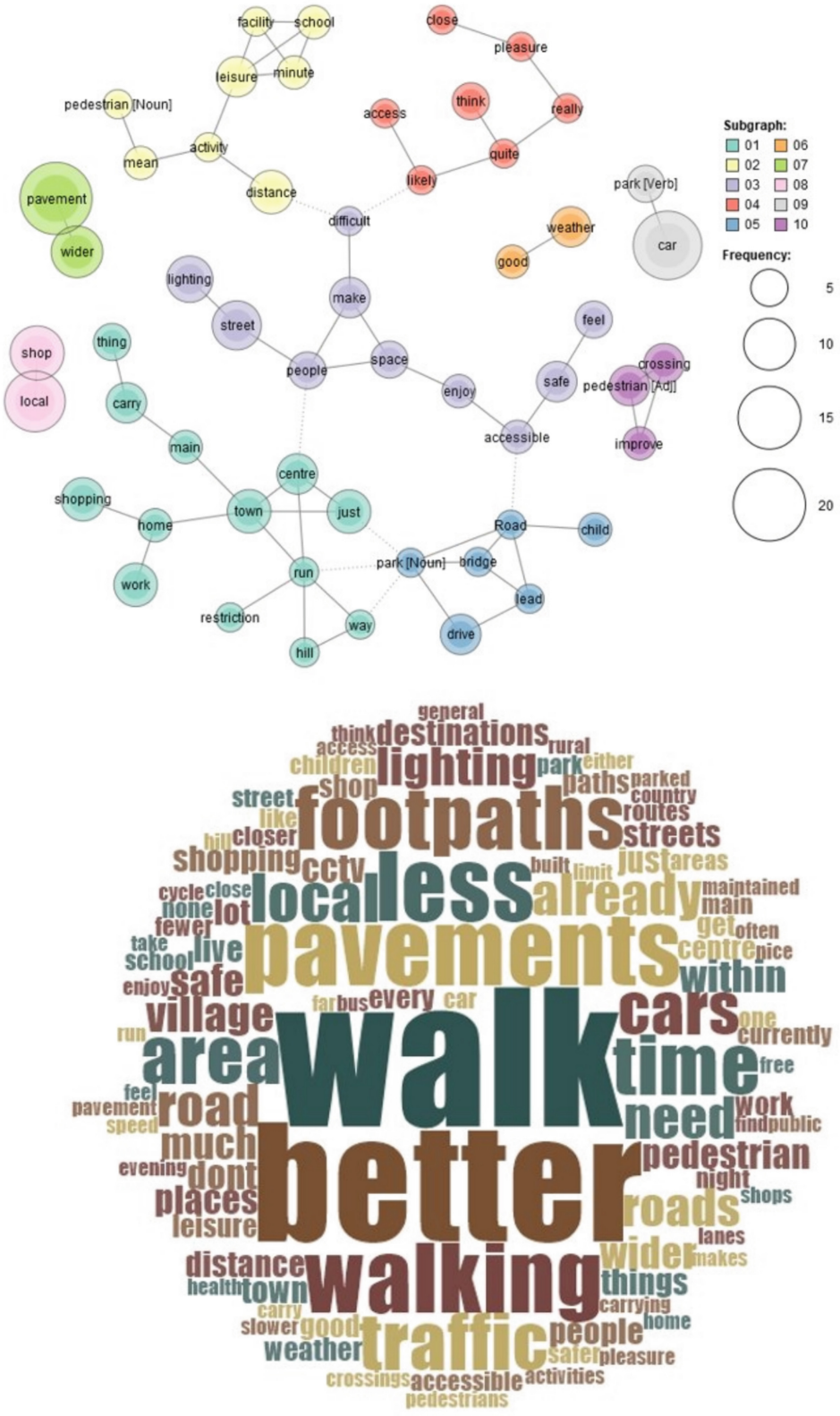

Fig. 9. Co-occurent word analysis and word cloud of responses from status-quo drivers on what would make them walk more: Drive to shop (N = 152).

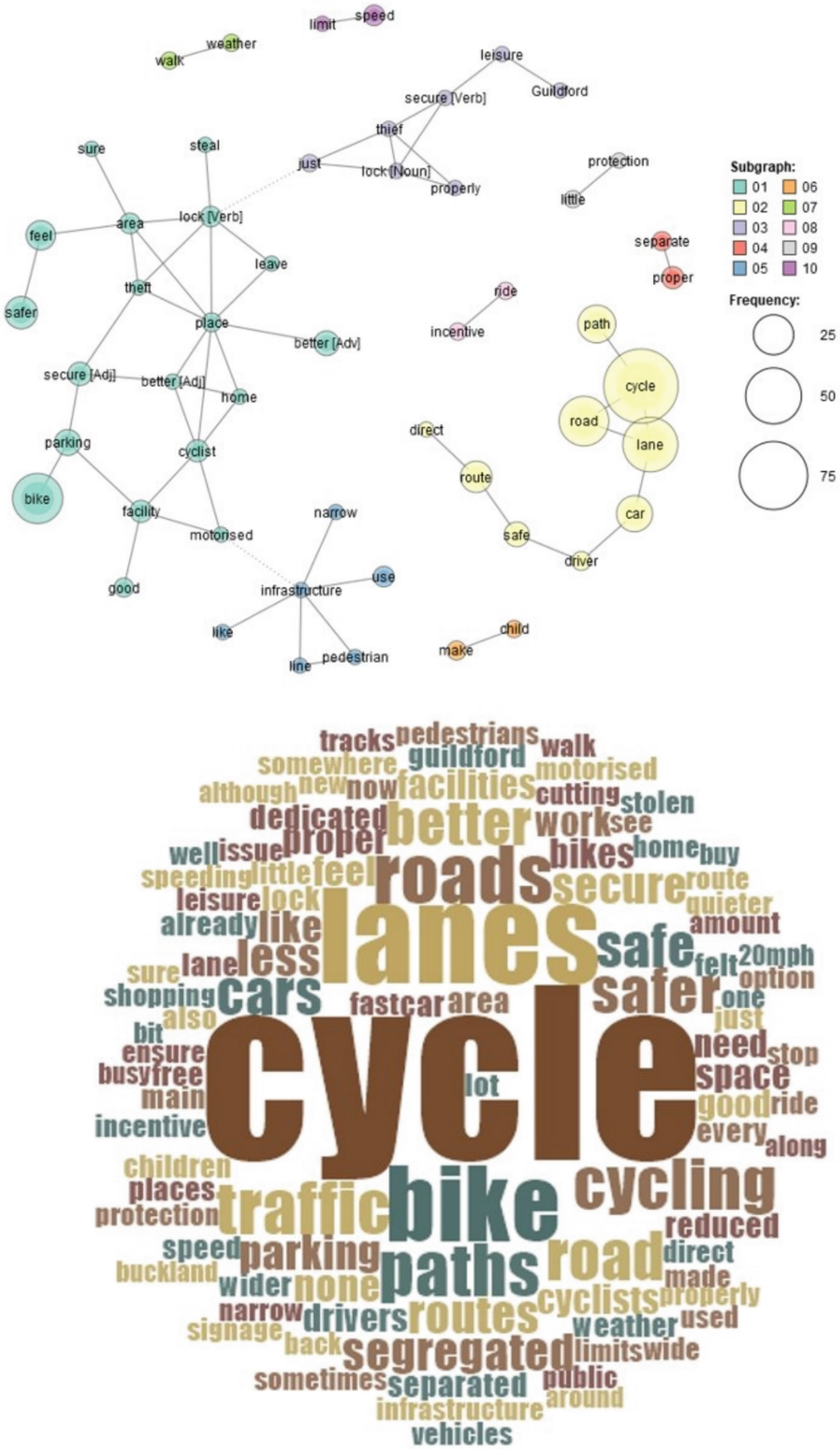

Fig. 10. Co-occurent word analysis and word cloud of responses from status-quo drivers on what would make them cycle more: Drive to shop (N = 152).

3.3 Most Effective Intervention

The effectiveness of each intervention is specified using a 6-point Likert scale (0 = Extremely Unlikely, 5 = Extremely Likely) by the likelihood of engaging in more walking or cycling, if the certain intervention is provided. In general, cycling interventions generate higher likelihood of active travel participation than walking interventions do. In view of the current reliance of a lot of respondents on car travel and the distance of travel destinations, cycling appears to be a relatively easier change of transport mode to achieve.

As anticipated, the effectiveness of walking and cycling interventions generally reveals a progressive increase across different Stages of Change, from Precontemplation to Maintenance. It is encouraging to see that respondents at the Contemplation/Decision/Action stage can be effectively nudged to take up more active travel, although the interventions work best among respondents who have already had the habit of walking or cycling at the Maintenance Stage of Change.

4 Discussion and Conclusion

4.1 Discussion

The findings of this analysis appear to confirm findings of similar studies conducted in other countries (e.g. Oikonomou et al., 2024). The available infrastructure and geomorphology of each area are always crucial factors for such survey respondents. Thus, it is important to reframe the cost narrative and adjust interventions to make them location specific (WSP, 2023). As anticipated, commonly reported barriers to take up active travel included:

- Lack of dedicated bicycle lanes
- Insufficient pedestrian crossings
- Inadequate lighting

Nevertheless, it is unclear what will be the long-term impact of the COVID-19 pandemic and the active travel policies introduced since then. Cycling stages increased during the pandemic from 1 to 1.2 billion, whereas walking stages decreased from 19 billion to 16 billion stages (DfT, 2022). As a result, it is important to take into account equity and bicycle sharing scheme management issues (Saud and Thomopoulos, 2021) when devising active travel policies. Such an approach would build on the findings of the transtheoretical model applied in this chapter, where behavioural change is seen as a process rather than as a one-off event. Targeting specific user groups e.g. car drivers, who are at a specific Stage of Change, has the potential to significantly increase the effectiveness of active travel and infrastructure planning.

4.2 Conclusion

This chapter has introduced the Stages of Change transtheoretical model (Prochaska et al., 1994) into the planning of active travel schemes and infrastructure. Based on a user survey in the UK, it highlighted the value of such an approach for both walking

and cycling. Although this chapter focused on the UK, findings are of interest for other car-dependent countries facing similar challenges after the COVID-19 pandemic.

As all cross-sectional surveys, the usual limitations apply. Sampling, timing and data issues pose individual challenges for such studies. Therefore, further studies in more locations are needed to establish the value of this approach. Future research should focus on both methodological and local specific challenges. Irrespective of the method and any local specificities though, the most important contribution of this chapter is that it reintroduced the value of the user perspective in transport planning and active travel in particular.

Appendix

How Many Survey Respondents Are in Each Stage?

Walking

To school with children

	(a) Not feasible	(b) Pre-contemplation	(c) Con-templation / Decision / Action	(d) Maintenance	*F* or χ^2	Tukey or Bonfer-roni
Gender[1]						
Age[2]						
Income[3]						
No. of household adults[2]						
No. of children (11 – 18 years old)[2]	0.94	0.25	0.31	0.55	3.29	a-c
No. of children (< 11 years old)[2]	0.36	0.75	1.56	1.05	9.42	c-a; d-a
Borough/district[2]						
Weekly trip frequency[4]						
Status-quo transport[5]					43.89	
by foot	4%, 1	0%, 0	31%, 5	79%, 15		d-a; d-b; d-c
by bicycle	0%, 0	50%, 2	19%, 3	16%, 3		b-a
by car	88%, 21	50%, 2	44%, 7	5%, 1		a-c; a-d; c-d
by public transport	8%, 2	0%, 0	6%, 1	0%, 0		
Distance to school[6]					33.89	
< 1 mile	4%, 1	0%, 0	19%, 3	68%, 13		d-a; d-c
1 – 5 miles	68%, 19	100%, 4	75%, 12	32%, 6		
5 – 10 miles	14%, 4	0%, 0	6%, 1	0%, 0		
> 10 miles	14%, 4	0%, 0	0%, 0	0%, 0		

All the listed statistics are significant at the 5% level.

[1]based on 75 responses, excluding 3 who prefer not to disclose.

[2]based on 78 responses.

[3]based on 57 responses, excluding 21 who prefer not to disclose.

[4]based on 64 responses.

[5]based on 63 responses.

[6]based on 67 responses, excluding 4 who do not have school aged children.

To work

	(a) Not feasible	(b) Pre-contemplation	(c) Con-templation / Decision / Action	(d) Maintenance	F or χ^2	Tukey or Bonfer-roni
Gender[1]						
Age[2]						
Income[3]						
No. of household adults[2]						
No. of children (11 – 18 years old)[2]						
No. of children (< 11 years old)[2]						
Borough/district[2]						
Weekly trip frequency[4]						
Status-quo transport[5]					15 1.45	
by foot	5%, 5	0%, 0	6%, 2	94%, 16		d-a; d-b; d-c
by bicycle	11%, 13	13%, 1	57%, 20	0%, 0		c-a; c-d
by car	59%, 67	87%, 7	34%, 12	0%, 0		a-d; b-c; b-d; c-d
by public transport	25%, 29	0%, 0	3%, 1	6%, 1		a-c
Distance to workplace[6]					62 .26	
< 1 mile	11%, 13	0%, 0	18%, 6	44%, 8		d-a
1 – 5 miles	21%, 25	72%, 5	67%, 23	56%, 10		b-a; c-a; d-a
5 – 10 miles	19%, 23	14%, 1	6%, 2	0%, 0		
> 10 miles	49%, 60	14%, 1	9%, 3	0%, 0		a-c; a-d

All the listed statistics are significant at the 5% level.

[1]based on 221 responses, excluding 7 who prefer not to disclose.

[2]based on 228 responses.

[3]based on 161 responses, excluding 67 who prefer not to disclose.

[4]based on 197 responses.

[5]based on 174 responses.

[6]based on 180 responses, excluding 27 who do not work.

To grocery/general shopping

	(a) Not feasible	(b) Pre-contemplation	(c) Con-templation / Decision / Action	(d) Maintenance	*F* or χ^2	Tukey or Bonfer-roni
Gender[1]						
Age[2]					24.87	
18 – 30 years old	8%, 6	12%, 1	21%, 27	11%, 4		
31 – 40 years old	17%, 13	25%, 2	28%, 35	20%, 8		
41 – 50 years old	27%, 20	12%, 1	21%, 27	29%, 11		
51 – 60 years old	37%, 28	12%, 1	15%, 19	29%, 11		a-c
> 60 years old	11%, 8	39%, 3	15%, 19	11%, 4		
Income[3]						
No. of household adults[2]						
No. of children (11 – 18 years old)[2]						
No. of children (< 11 years old)[2]						
Borough/district[2]						
Weekly trip frequency[4]	2.30	2.38	2.50	4.49	9.17	d-a; d-c
Status-quo transport[5]					112.33	
by foot	4%, 3	0%, 0	19%, 23	89%, 32		c-a; d-a; d-b; d-c
by bicycle	6%, 4	0%, 0	13%, 16	11%, 4		
by car	89%, 62	100%, 8	68%, 82	0%, 0		a-c; a-d; b-d; c-d
by public transport	1%, 1	0%, 0	0%, 0	0%, 0		
Distance to shopping facilities[6]					71.70	
< 1 mile	5%, 4	13%, 1	46%, 58	79%, 30		c-a; d-a; d-b; d-c
1 – 5 miles	84%, 61	74%, 6	52%, 65	18%, 7		a-c; a-d; b-d; c-d
5 – 10 miles	7%, 5	13%, 1	2%, 3	3%, 1		
> 10 miles	4%, 3	0%, 0	0%, 0	0%, 0		

All the listed statistics are significant at the 5% level.

[1]based on 241 responses, excluding 7 who prefer not to disclose.

[2]based on 248 responses.

[3]based on 176 responses, excluding 72 who prefer not to disclose.

[4]based on 241 responses.

[5]based on 235 responses.

[6]based on 245 responses.

To leisure places

	(a) Not feasible	(b) Pre-contemplation	(c) Con-templation / Decision / Action	(d) Maintenance	*F* or χ^2	Tukey or Bonfer-roni
Gender[1]					12.84	
female	76%, 32	22%, 2	52%, 82	50%, 17		a-b; a-c
male	24%, 10	78%, 7	47%, 74	50%, 17		b-a; c-a
non-binary/third gender	0%, 0	0%, 0	1%, 1	0%, 0		
Age[2]						
Income[3]						
No. of household adults[2]						
No. of children (11 – 18 years old)[2]						
No. of children (< 11 years old)[2]						
Borough/district[2]						
Weekly trip frequency[4]	3.90	2.00	4.36	6.89	4.21	d-a; d-b; d-c
Status-quo transport[5]					32.18	
by foot	11%, 5	11%, 1	23%, 36	59%, 20		d-a; d-c
by bicycle	14%, 6	0%, 0	13%, 20	15%, 5		
by car	73%, 32	89%, 8	59%, 91	26%, 9		a-d; b-d; c-d
by public transport	2%, 1	0%, 0	5%, 8	0%, 0		

All the listed statistics are significant at the 5% level.

[1]based on 242 responses, excluding 7 who prefer not to disclose.

[2]based on 249 responses.

[3]based on 177 responses, excluding 72 who prefer not to disclose.

[4]based on 243 responses.

[5]based on 242 responses.

Cycling

To school with children

	(a) Not feasible	(b) Pre-contemplation	(c) Con-templation / Decision / Action	(d) Maintenance	*F* or χ^2	Tukey or Bonfer-roni
Gender[1]						
Age[2]						
Income[3]						
No. of household adults[2]						
No. of children (11 – 18 years old)[2]						
No. of children (< 11 years old)[2]	0.54	0.55	1.19	1.38	3.83	c-a
Borough/district[2]						
Weekly trip frequency[4]						
Status-quo transport[5]					62.64	
by foot	33%, 6	25%, 2	52%, 13	0%, 0		
by bicycle	0%, 0	0%, 0	0%, 0	100%, 7		d-a; d-b; d-c
by car	56%, 10	75%, 6	44%, 11	0%, 0		b-d
by public transport	11%, 2	0%, 0	4%, 1	0%, 0		
Distance to school[6]						

All the listed statistics are significant at the 5% level.

[1]based on 70 responses, excluding 1 who prefer not to disclose.

[2]based on 71 responses.

[3]based on 49 responses, excluding 22 who prefer not to disclose.

[4]based on 62 responses.

[5]based on 58 responses.

[6]based on 64 responses, excluding 4 who do not have school aged children.

To work

	(a) Not feasible	(b) Pre-contemplation	(c) Con-templation / Decision / Action	(d) Maintenance	F or χ^2	Tukey or Bonfer-roni
Gender[1]					14.39	
female	56%, 69	59%, 10	60%, 39	30%, 8		c-d
male	44%, 54	41%, 7	40%, 26	67%, 18		
non-binary/third gender	0%, 0	0%, 0	0%, 0	3%, 1		
Age[2]					34.95	
18 – 30 years old	10%, 13	18%, 3	23%, 15	30%, 8		d-a
31 – 40 years old	21%, 28	6%, 1	32%, 21	34%, 9		
41 – 50 years old	20%, 26	35%, 6	28%, 18	22%, 6		
51 – 60 years old	31%, 40	23%, 4	17%, 11	7%, 2		
> 60 years old	18%, 23	18%, 3	0%, 0	7%, 2		a-c; b-c
Income[3]						
No. of household adults[2]	2.00	2.41	2.46	1.93	6.39	c-a; c-d
No. of children (11 – 18 years old)[2]						
No. of children (< 11 years old)[2]						
Borough/district[2]						
Weekly trip frequency[4]	3.50	3.80	5.10	4.62	3.01	c-a
Status-quo transport[5]					74.25	
by foot	15%, 11	21%, 3	14%, 9	0%, 0		
by bicycle	8%, 6	0%, 0	13%, 8	81%, 21		d-a; d-b; d-c
by car	57%, 42	65%, 9	55%, 34	8%, 2		a-d; b-d; c-d
by public transport	20%, 15	14%, 2	18%, 11	11%, 3		
Distance to workplace[6]						

All the listed statistics are significant at the 5% level.

[1]based on 232 responses, excluding 7 who prefer not to disclose.

[2]based on 239 responses.

[3]based on 168 responses, excluding 71 who prefer not to disclose.

[4]based on 201 responses.

[5]based on 176 responses.

[6]based on 180 responses, excluding 31 who do not work.

To grocery/general shopping

	(a) Not feasible	(b) Pre-contemplation	(c) Con-templation / Decision / Action	(d) Maintenance	*F* or χ^2	Tukey or Bonfer-roni
Gender[1]						
Age[2]						
Income[3]						
No. of household adults[2]						
No. of children (11 – 18 years old)[2]						
No. of children (< 11 years old)[2]	0.14	0.31	0.43	0.06	4.08	c-a
Borough/district[2]						
Weekly trip frequency[4]						
Status-quo transport[5]					99.86	
by foot	15%, 13	34%, 11	31%, 32	13%, 2		
by bicycle	1%, 1	0%, 0	12%, 12	80%, 12		c-a; d-a; d-b; d-c
by car	83%, 70	66%, 21	57%, 59	7%, 1		a-c; a-d; b-d; c-d
by public transport	1%, 1	0%, 0	0%, 0	0%, 0		
Distance to shopping facilities[6]					118.74	
< 1 mile	24%, 21	46%, 16	49%, 52	44%, 7		c-a
1 – 5 miles	67%, 60	51%, 18	48%, 51	56%, 9		a-c
5 – 10 miles	7%, 6	0%, 0	3%, 4	0%, 0		
> 10 miles	2%, 2	3%, 1	0%, 0	0%, 0		

All the listed statistics are significant at the 5% level.

[1]based on 244 responses, excluding 7 who prefer not to disclose.

[2]based on 251 responses.

[3]based on 179 responses, excluding 72 who prefer not to disclose.

[4]based on 243 responses.

[5]based on 235 responses.

[6]based on 247 responses.

To leisure places

	(a) Not feasible	(b) Pre-contemplation	(c) Contemplation / Decision / Action	(d) Maintenance	F or χ^2	Tukey or Bonferroni
Gender[1]						
Age[2]					25.84	
18 – 30 years old	12%, 7	13%, 4	19%, 25	10%, 3		
31 – 40 years old	17%, 10	10%, 3	30%, 40	20%, 6		
41 – 50 years old	16%, 9	26%, 8	26%, 34	27%, 8		
51 – 60 years old	31%, 18	29%, 9	19%, 25	27%, 8		
> 60 years old	24%, 14	22%, 7	6%, 8	16%, 5		a-c; b-c
Income[3]						
No. of household adults[2]	1.98	2.16	2.30	1.80	4.49	c-d
No. of children (11 – 18 years old)[2]						
No. of children (< 11 years old)[2]						
Borough/district[2]						
Weekly trip frequency[4]						
Status-quo transport[5]					80.96	
by foot	28%, 15	20%, 6	27%, 36	17%, 5		
by bicycle	0%, 0	0%, 0	11%, 14	62%, 18		d-a; d-b; d-c
by car	66%, 35	70%, 21	60%, 79	17%, 5		a-d; b-d; c-d
by public transport	6%, 3	10%, 3	2%, 2	4%, 1		

All the listed statistics are significant at the 5% level.
[1]based on 244 responses, excluding 7 who prefer not to disclose.
[2]based on 251 responses.
[3]based on 179 responses, excluding 72 who prefer not to disclose.
[4]based on 245 responses.
[5]based on 243 responses.

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